APPENDIX B

RANGE INFORMATION/DESCRIPTIONS/CELLS

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RANGE INFORMATION / DESCRIPTIONS / CELLS

Range cells included in this appendix were created, which included *historical* regulations, manuals, photos, drawings, and documents. They represent typical (general) layouts, which include firing lines, target areas, target berms, and danger areas (aka SDZ). Each cell is a two-dimensional model, which does not take into account (during time of use) terrain, boundaries, or local requirements and/or restrictions.

As stated in an obsolete Army Regulation, AR 750-10, *Range Regulations for Firing Ammunition in Time of Peace,* dated May 22, 1939, "It is obviously impossible for any general range regulation to cover each local situation completely. Such additional regulations as may be necessary to meet local condition will therefore, be prepared and enforced by the post, camp, or station commander."

When the ranges were established, regulations such as AR 750-10 (now obsolete), along with others, such as TM 9-855, *Targets, Target Material, and Training Course Lay-Outs,* dated August 17, 1944 (now obsolete) would have been referenced. These guidelines would have been applied to the local environment at the time of construction.

Where applicable, right and left firing limits and down-range limits were required and set based on the local conditions. Taking in-to account the scores of ranges and the lack of first-hand knowledge, many ranges were estimated using the best available resources. Topographic maps were analyzed to determine if terrain features could be used to limit the extent of the range.

For most sites it's likely to locate numerous historical maps displaying firing ranges drawn in a various configurations, but not necessarily with a true representation. For instance, they may show the range as nothing more than a dot, a box, circles, or a V-shaped fan. However, in rare cases, a range map displays what appears to be a true fan with a calculated danger area. In these cases, the range fans may be a true representation of the actual range boundaries, and therefore be considered for use instead of the general *Range Cells.* An example where this applies is shown below:

A historical range map found for Fort Custer, Michigan identified numerous ranges, all having range fans drawn. The fans displayed on this map appear to be proportioned, and closely represent correct angles and distances according to regulations. It is believed this map was done with a high degree of accuracy; therefore the range fans were used instead of the general *Range Cells.* Also recovered, was a document referring to the artillery range. It explained the necessity to discontinue firing of artillery on this facility because of the inconvenience of reducing the propelling charges

on 155mm Artillery Shells. The rational behind this reduced charge was to minimize the down-range distance the projectile would travel. At charge 7 (max), a 155mm projectile had a maximum range of approximately 17,400 yards. In addition to this distance, regulations required a mandatory 1,000-yard buffer zone beyond the max range. If the max charge had been used to calculate the danger area, the downrange distance for this artillery range would have extended more than 6-miles beyond the installation boundary. Maximum distance on artillery munitions can be calculated using appropriate Ammunition Firing Tables.

Unfortunately, this detailed information is seldom available. Other options to consider are included in the following example where the use of topographic maps and site inspections were used to determine the boundaries of Spencer Mountain Rifle Range in North Carolina.

The only available map displayed the range as a small rectangular box. Documents recovered stated that the range was positioned at the base of the mountain in order to reduce the danger area. The *range cell* for a rifle range was designed to include 50 firing positions, which calculates to a width of 400 yards. However, during the site inspection, the actual width of the range was determined to be no more than 150 feet. By reducing the width of the *range cell,* and using contour lines on a topographic map the delineated boundaries was realistically reduced from the standard 1259 acres down to 72 acres.

As indicated, there are many variables to account for when developing range boundaries, and it is unlikely that all of the data used when the range was originally laid out will be available. Therefore, the historical data found during research (maps, aerial photos, documentation, etc.) was utilized to represent the range as accurately as possible. In most cases, the only option was to use the general *Range Cell*.

Each range description contains a list of Ammunition Data sheets. The intention of this list is to provide a general idea of the ordnance that could have been used on the range. It is not intended to be all-inclusive and by no-means is an indication that these munitions are actually present.

A significant number of manuals, drawings, letters, instructions, reports, and miscellaneous documents were referenced in order to calculate the *Range Cells*. The following non-inclusive list are published Range Manuals that were referenced to create the range cells.

- TR 140-5, *Range Regulations for Firing Ammunition in Time of Peace,* dated November 1931
- AR 750-10, *Range Regulations for Firing Ammunition in Time of Peace,* dated May 1939

- AAF Manual 85-0.1, *Army Air Forces Gunnery and Bombardment Ranges,* dated June 1945
- AD-A954 905, *Training in the Ground Army 1942-1945, Study No. 11,* dated May 1948
- *Second Air Force Ground Gunnery Range*, dated July 24, 1943
- TM 9-855, *Targets, Target Material, and Training Course Lay-Outs,* dated August 1944
- TM 9-855, *Targets, Target Material, and Training Course Lay-Outs,* dated November 1951
- AFM No. 66, *Poorman Flexible Gunnery Trainer,* dated March 1945
- TC 25-1, *Training Land*, dated August 1978
- TC 25-8, *Training Ranges,* dated February 1992
- AFI 13-212, Vols 1,2,3, *Space, Missile, Command, and Control, Weapons Ranges,* dated July 1994
- AR 210-21¸ *Army Ranges and Training Land Programs,* dated May 1997
- AR 385-62¸ *Regulation for Firing Guided Missiles and Heavy Rockets for Training, Target Practice, and Combat,* dated June 1983
- AR 385-63, *Policies and Procedures for Firing Ammunition for Training, Target Practice, and Combat,* dated November 1983

HISTORIC USE: TRAINING AREA/MANEUVER AREA

CAVE

Range Type: Training Area / Maneuver Area

Cell Name(s): None available

Training areas are established locally to meet specific requirements. They typically utilize available terrain features such as natural caves to simulate mountain type fortifications. No available references describe these areas. A description of this training area would come from historical documents relating to a particular site; and the boundaries delineated on historical maps should be used in lieu of a standard cell.

It is speculated that practice munitions would have been used on an area such as this. All weapons available to the infantry may have been utilized. These would have included: small arms, rockets, mortars, rifle grenades, hand grenades, and flame-throwers.

Ammunition (probable)	Max Range (yards)
Small Arms, Blanks	N/A
Rocket, 2.36", Practice	700
Rifle Grenade, Practice	< 400
60mm, Training	350
60mm, Practice	1,935
81mm, Training	350
81mm, Practice	3,300
Practice Hand Grenades	N/A
Pyrotechnics	N/A
Flame Thrower	N/A

Data sheet(s):

CTT01	Small arms, General
CTT04	M21, Practice Hand Grenade
	Mk1A1 Training Hand Grenade
CTT10	M7A1 Practice Rocket, 2.36"
	M112A2 Practice Rifle Grenade
CTT18	60mm, Training, M69
	60mm, Practice, M50A2
	81mm, Training, M68
	81mm, Practice, M43A1

Pyrotechnic data sheets from this era are not available in the database

Reference(s): No references available

COMBAT IN CITIES COURSE (aka: Village, Jungle Village, Mock City, MOUT Site)

Range Type: Training Area / Maneuver Area

Cell Name(s)s: CCI3W

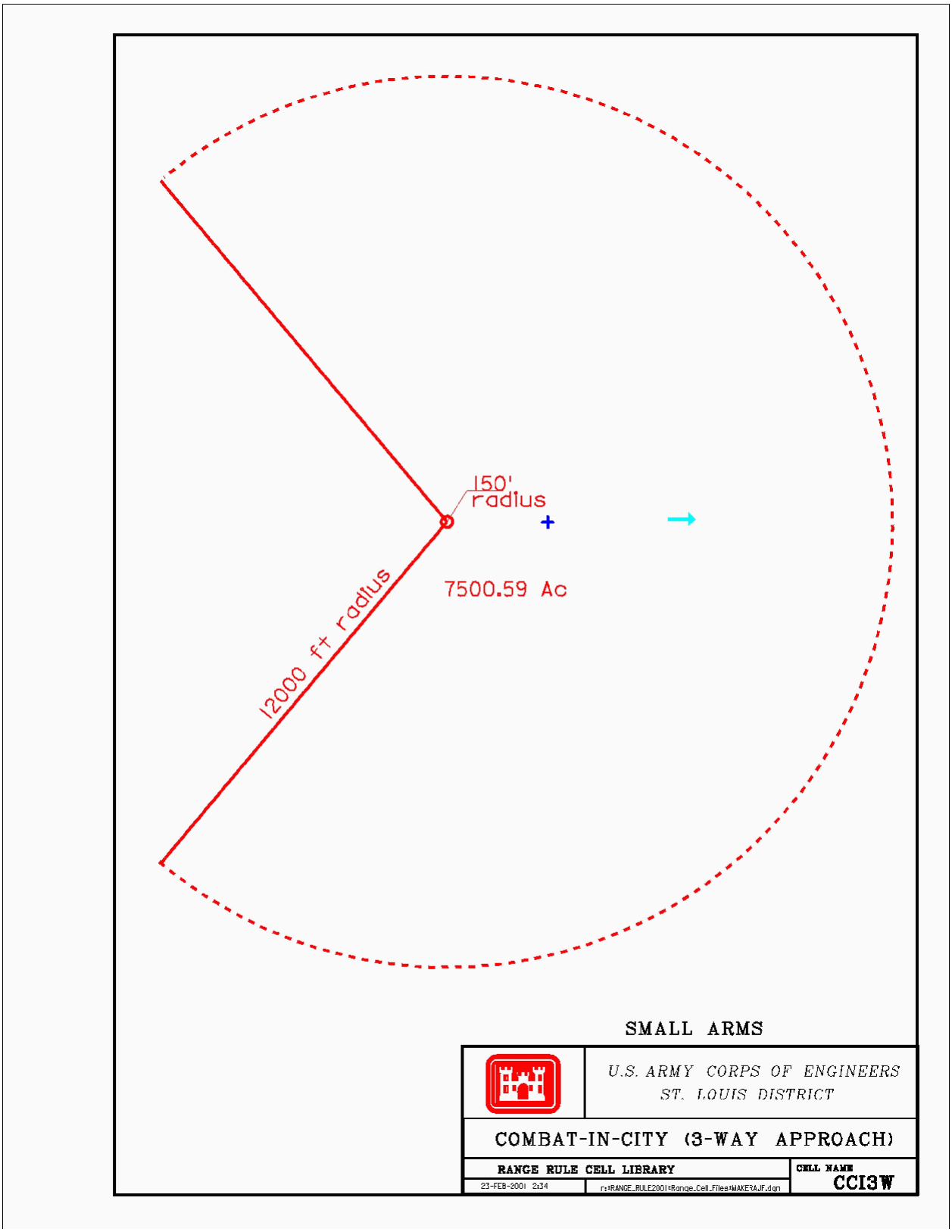
Mock villages may consist of anything from a few grass huts to as much as a small city complete with full size buildings, roads, wells, fountains etc. Facilities were constructed to meet specific training requirements. Regardless of the structures, training was designed for house-to-house fighting. The 3-way approach course permits a 180° field of fire, versus direct fire for the single approach course. Ammunition use was restricted by regulations to M2, cal. .30 or others that do not require a danger area that exceeds 4,000 yards. Training may have included the use of pyrotechnics, booby traps, and land mines.

Ammunition (probable)	Max Range (yards)	Muzzle Velocity (fps)
.45 caliber	1,600	802
.30 caliber	3,450	2,700
.22 caliber	1,500	1,100
Small arms Blanks		
Pyrotechnics		

Data sheet(s):

CTT01 Small arms, General
Pyrotechnic data sheets from this era are not available in the database

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace,* May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951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radius
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U.S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT
COMBAT-IN-CITY (3-WAY APPROACH)
RANGE RULE CELL LIBRARY
23-FEB-2001 2:34
r:\RANGE_RULE2001\Range_Cell_Files\MAKERAJF.dgn
CELL NAME
CCI3W

COMBAT IN CITIES COURSE (aka: Village, Jungle Village, Mock City, MOUT Site)

Range Type: Training Area / Maneuver Area

Cell Name(s): CCITY

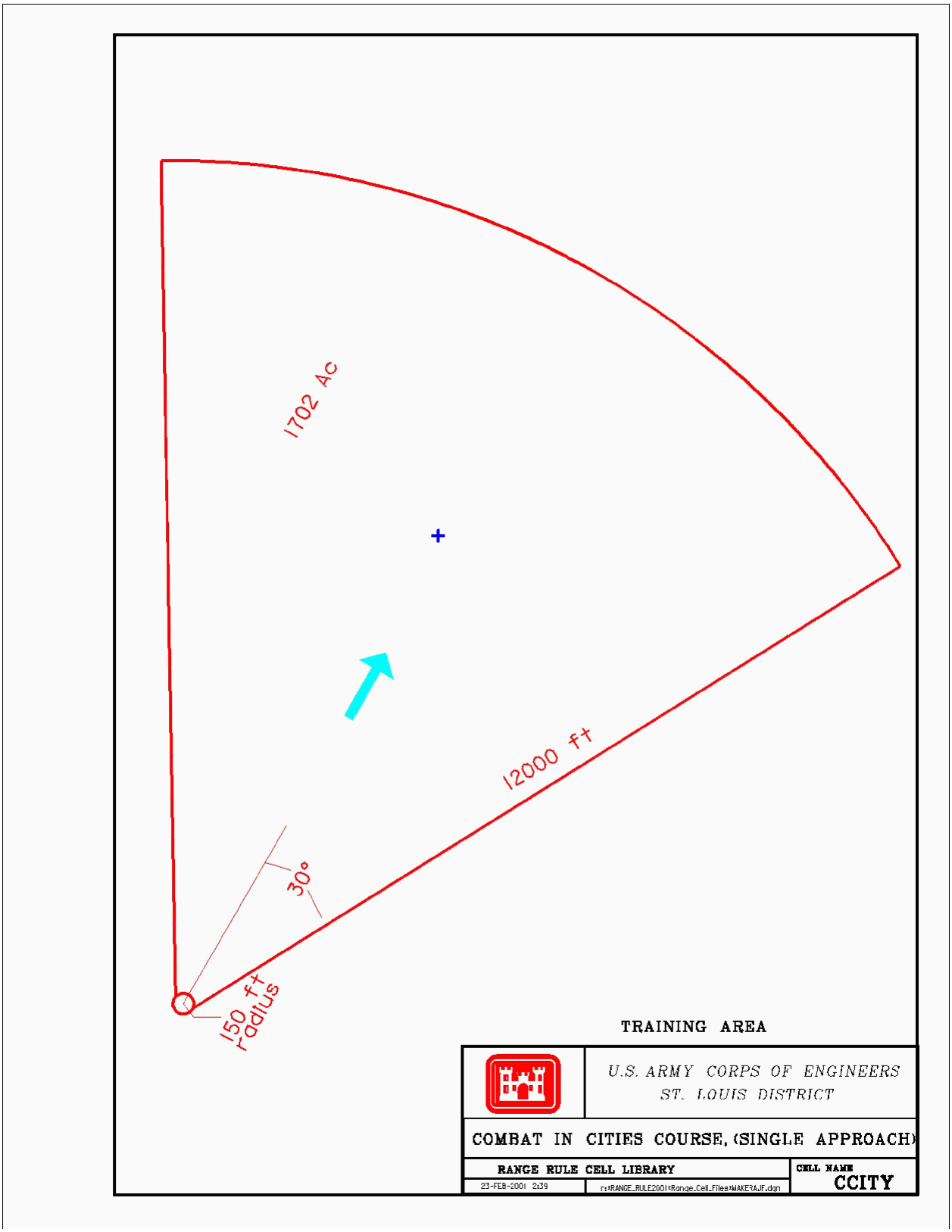
Mock villages may consist of anything from a few grass huts to as much as a small city complete with full size buildings, roads, wells, fountains etc. Facilities were constructed to meet specific training requirements. Regardless of the structures, training was designed for house-to-house fighting. The 3-way approach course permits a 180° field of fire, versus direct fire for the single approach course. Ammunition use was restricted by regulations to M2, cal. .30 or others that do not require a danger area that exceeds 4,000 yards. Training may have included the use of pyrotechnics, booby traps, and land mines.

Ammunition (probable)	Max Range (yards)	Muzzle Velocity (fps)
.45 caliber	1,600	802
.30 caliber	3,450	2,700
.22 caliber	1,500	1,100
Small arms Blanks		
Pyrotechnics		

Data sheet(s):

CTT01 Small arms, General
Pyrotechnic data sheets from this era are not available in the database

Reference(s): *AR 750-10, Range Regulations for Firing Ammunition in Time of Peace,* May 1939 – January 1944; *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951


1702 Ac
12000 ft
30°
150 ft
radius
TRAINING AREA
U.S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT
COMBAT IN CITIES COURSE, (SINGLE APPROACH)
RANGE RULE CELL LIBRARY
23-FEB-2001 2:39
r:\RANGE_RULE2001\Range_Cell_Files\MAKERAJF.dgn
CELL NAME
CCITY

FLAME THROWER

Range Type: Training Area

Cell Name(s): FLAME

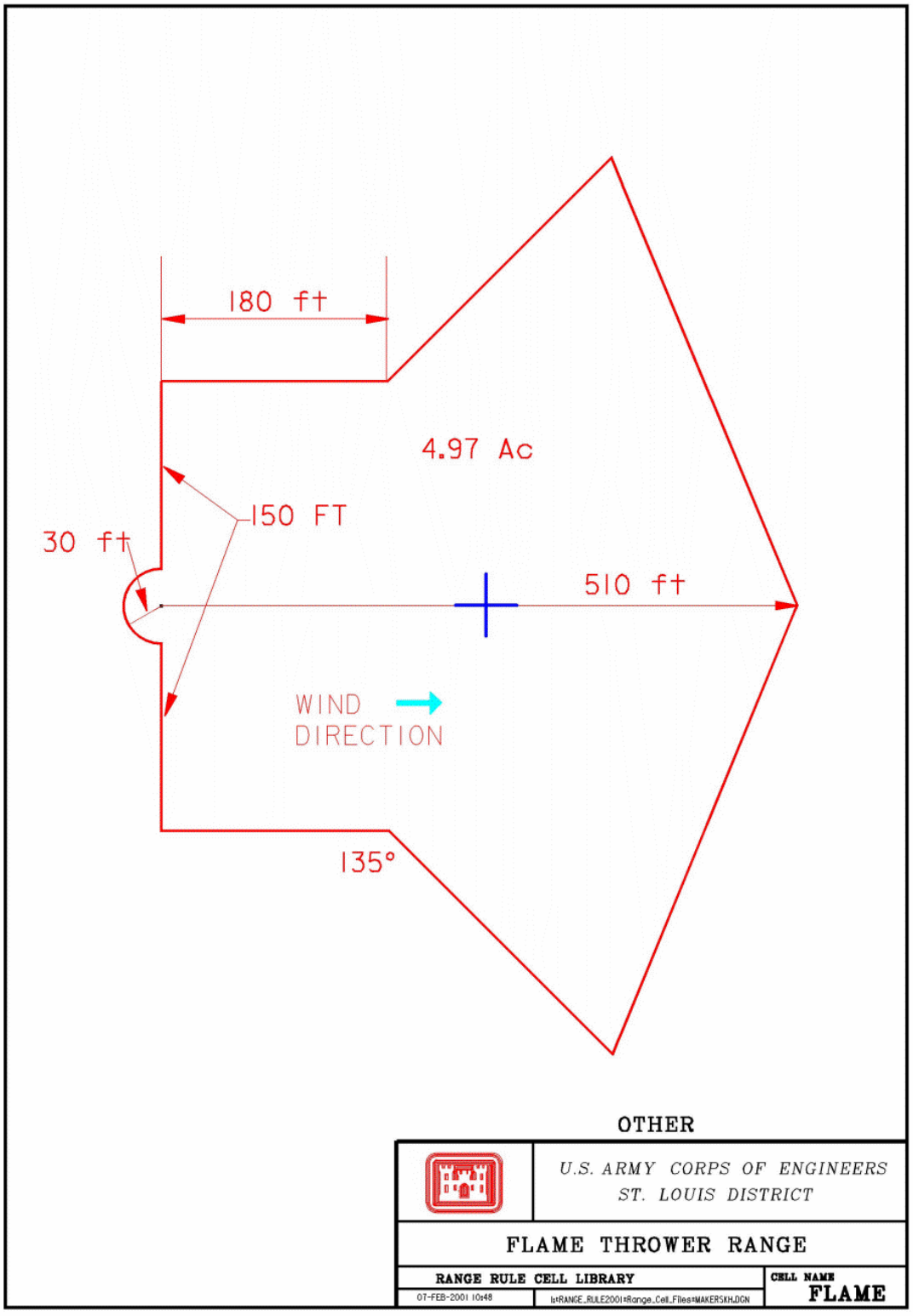
A flame-thrower range is 10 yards wide at the firing line and has a safety fan that extends a distance of 50-yards on each side of the firing line. The danger area begins at each end of the safety fan, extends down range a distance of 60 yards, at which point it continues on a 45° angle from the centerline an additional 50 yards. Typical targets used were concrete structures resembling pillboxes.

Ammunition (probable)	Max Range (yards)	Muzzle Velocity (fps)
None	N/A	N/A

Data sheet(s):

No data sheets available

Reference(s): *TM 9-855, Targets, Target Material, and Training Course Lay-outs*, August 1944 & November 1951


180 ft
4.97 Ac
150 FT
30 ft
510 ft
WIND
DIRECTION
135°
OTHER
U.S. ARMY CORPS OF ENGINEERS
ST. LOUIS DISTRICT
FLAME THROWER RANGE
RANGE RULE CELL LIBRARY
07-FEB-2001 10:48
\\tRANGE_RULE2001\tRange_Cell_Files\MAKERSKH.DGN
CELL NAME
FLAME

PILL BOX

Range Type: Training Area / Maneuver Area

Cell Name(s): None available

In general, the training area consists of a single or multiple concrete fortifications, commonly referred to as pillboxes. The area may be a 10-foot by 10-foot concrete box or a large concrete gun emplacement on the side of mountain. No available references describe these areas. A description of this training area would come from historical documents relating to a particular site; and the boundaries delineated on historical maps should be used in lieu of a standard cell.

It is assumed that practice munitions would have been used on an area such as this. All weapons available to the infantry may have been utilized. These include: small arms, rockets, mortars, rifle grenades, hand grenades, and flame-throwers.

Ammunition (probable)	Max Range (yards)
Small Arms, Blanks	N/A
Rocket, 2.36", Practice	700
Rifle Grenade, Practice	< 400
60mm, Training	350
60mm, Practice	1,935
81mm, Training	350
81mm, Practice	3,300
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Flame Thrower	N/A

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CTT10	M7A1 Practice Rocket, 2.36"
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CTT18	60mm, Training, M69
	60mm, Practice, M50A2
	81mm, Training, M68
	81mm, Practice, M43A1

Pyrotechnic data sheets from this era are not available in the database.

Reference(s): No references available

TYPES OF TRAINING AREAS

There are six different types of training areas: Institutional Area, Garrison Area, Local Training Area, Major Training Area, Range and Impact Area, and National Training Center.

An **Institutional Area** is usually associated with service schools and training centers. But, the division post also has an institutional setting. For example, schools at division posts conduct Primary Noncommissioned Officer Courses (PNCOC), Basic Noncommissioned Officer Co (BNCOC), Primary Leadership Courses (PLC), and NCO Academies. The skills acquired at institutions focus on individual proficiency. Institutional courses cannot be taught at other training areas because they require educational devices, which can only be used cost effectively in the classroom.

A **Garrison Area** includes such things as barracks, dayrooms, motor pools, battalion classrooms, parade fields, and installation warehouse facilities. Garrison training areas are usually controlled by a company or battalion commander. While in the garrison area, soldiers learn by using Soldier's Manuals, Training Extension Courses (TEC), Army Correspondence Courses (ACCP), field manuals, training circulars, simulation devices, and some actual weapons. Garrison training concentrates on individual proficiency. A garrison area requires small amounts of land.

A **Local Training Area** consists of sites close to the garrison area. Usually, these sites are only large enough to conduct training up to the company level. The local training area is normally controlled by the post or division headquarters. Sometimes, individual training takes place in this area; but more often, it is used for the collective training of crew through company units. In many instances, it is at the local training area where the collective training process begins.

The **Major Training Area** is a large site used to train units above company level. As a minimum, the major training area at the division post should be large enough to let battalions meet their ARTEP requirements. The type of training conducted in this area varies with the unit and the characteristics of the training site. However, it usually consists of live fire exercises, unit maneuvers, simulation engagements, and Army Training and Evaluation Program (ARTEP) tasks without troops. Because of the size of the major training area, units may have to travel many miles from their garrison area.

A **Range and Impact Area** is located at the division post where units can fire their major weapon systems, which include armor, anti-armor, infantry, artillery, air defense, and Army air-delivered weapons. The impact area is that portion of the training area contaminated by duds. Because of this, it cannot be used for maneuver training. Munitions that do not explode (SABOT projectiles and small arms rounds) may be used in maneuver areas as long as troops stay out of the safety fan during firing.

National Training Center information can be obtained from the cited reference below.

Reference(s): TC 25-1, *Training Land*, August 1978